Transversus abdominis release (TAR) for major ventral hernia: repairing the pear-shaped abdomen.

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BACKGROUND

Large, complex ventral hernias in obese patients with loss of domain are challenging. Transversus abdominis release (TAR) allows for fascial closure of large complex ventral hernias. We present a case series outlining Counties Manukau Health's early experience with TAR analysing demographics, imaging data, and adverse outcomes. More than 1200 laparoscopic and open ventral hernias were performed in the study period, of these 28 underwent TAR. There were 11 significant complications including one recurrence and an early community cardiac death. Our early results with TAR suggest that it allows for anatomical reconstruction of the anterior abdominal wall in cases where few other options are available.

METHODS

We performed a retrospective data analysis of all ventral hernia operation that took place at Middlemore Hospital and Manukau Surgery Centre between January 2015 and December 2020. Patients who underwent TAR were analysed for demographics, pre-operative status, imaging data, perioperative events, adverse outcomes, and recurrence. Data was extracted from clinic letters, pre-operative and post-operative imaging, operation notes, operating room data, and clinical notes.

RESULTS

798 open ventral hernia repairs took place during the study period, of these 28 underwent TAR. There were seventeen woman (61%) with a mean age of 58.8 (37-77) years old. Eighteen (64%) patients had incisional hernias, 8 (29%) had a recurrent ventral hernia, and 2 (7%) had a primary hernia. The mean BMI was 37.3 (23-60) kg/m2 with a median ASA of 2 (1-3). The most prevalent comorbidity was obesity (78.6%) followed by type 2 diabetes (32%).

Two TAR repairs were performed acutely. The mean defect diameter was 10.9 (5–23) cm and the mean area of mesh used was 1218 (500–1800) cm2. The median operative time was 156 (84–397) minutes with a median hospital stay of 5 (2-12) nights.

Complication	n (%)	Comment
Seroma	4 (14.2%)	All but 1 was managed conservatively due to developing into a chronic symptomatic seroma requiring repeated drainages.
Wound infection	2 (7.1%)	Managed with antibiotics and negative pressure dressings in the community.
Hematoma	3 (10.7%)	Managed non-operatively.
Recurrence	1 (3.6%)	Did not recur at midline, but laterally at the free edge of the oblique muscles and repaired acutely with onlay mesh.
Death	1 (3.6%)	Community cardiac death following an uneventful GA and post-operative period.

Table 1: Summary and comments of the 11 major complications encountered.

DISCUSSION

TAR was first described in the literature by Novitsky et al in 2012 as a novel approach to tackle the problematic complex ventral hernia offering low morbidity and recurrence. They were able to demonstrate the advantages of TAR being: significant posterior myofascial mobilization, up to 10cm per side; lateral dissection allowing for preservation of the rectus neurovascular supply; limited subcutaneous undermining; and development of a large retro-rectus and extraperitoneal space for large sublay mesh (1).

Complex large ventral hernia repair is a challenge due to its high rates of morbidity and recurrence. Our early results suggests TAR allows for anatomical reconstruction of the anterior abdominal wall with good outcomes when few other options are available.

REFERENCES

(1)Novitsky, Y.W., et al., *Transversus abdominis muscle release: a novel approach to posterior component separation during complex abdominal wall reconstruction.* Am J Surg, 2012. **204**(5): p. 709-16.

(2)Rosen, M.J., *Atlas of Abdominal Wall Reconstruction*. 2017, Elsevier.

MEDICAL IMAGING

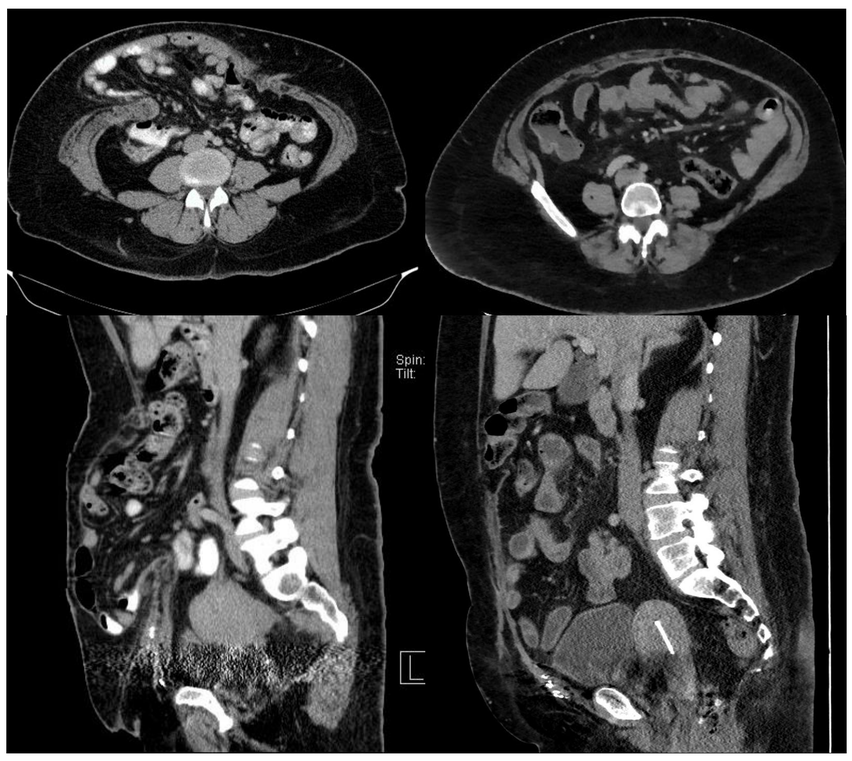

Figure 1: 49 year old woman with a recurrent incisional hernia following laparoscopic repair of an incisional hernia after an open anterior resection. *Top left:* preoperative axial computed topography (CT) image showing a large ventral hernia containing small bowel with a large hernia neck. *Bottom left:* Sagittal CT image showing her hernia containing small and large bowel. *Top right:* Axial CT image performed 4 years post elective TAR with good results. *Bottom right:* Sagittal CT image showing a successful repair.

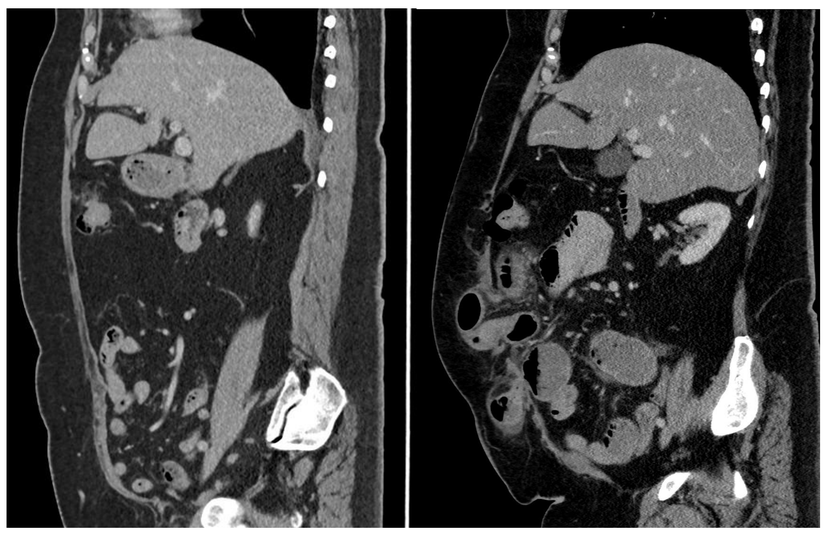

Figure 2: 74 year old woman who presented acutely with an obstructed ventral hernia whose had a previous anterior resection and an open abdominal hysterectomy. *Left:* Sagittal CT image best demonstrating three separate incisional midline hernias. *Right:* Sagittal image three years following acute TAR repair with good results.

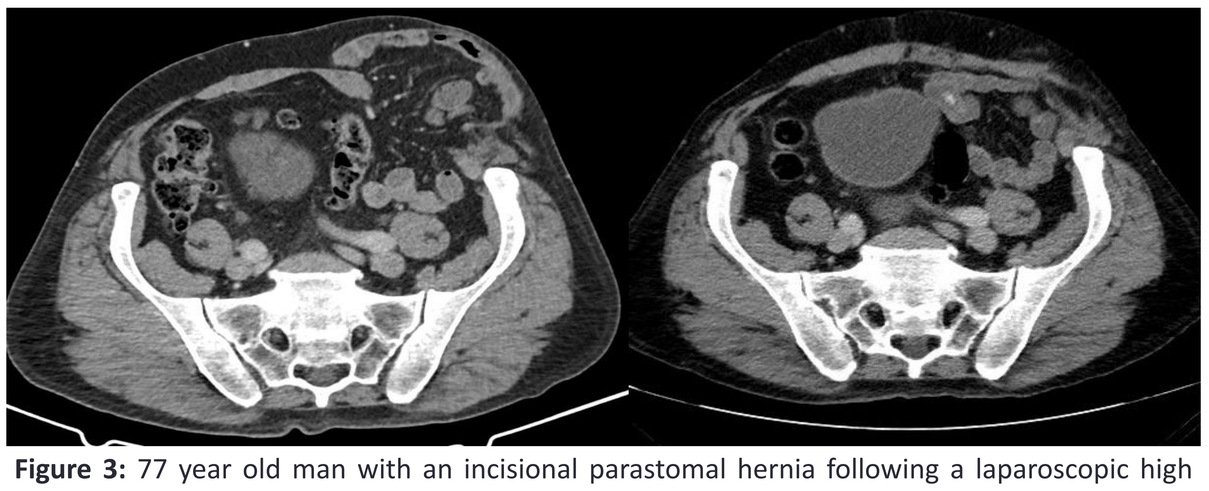

Figure 3: 77 year old man with an incisional parastomal hernia following a laparoscopic high anterior resection. *Left:* CT axial slice of a large left-sided incisional hernia containing small bowel and its mesentery following ileostomy reversal. *Right:* Axial CT image 6 months post TAR repair showing anatomical reconstruction of the abdominal wall.

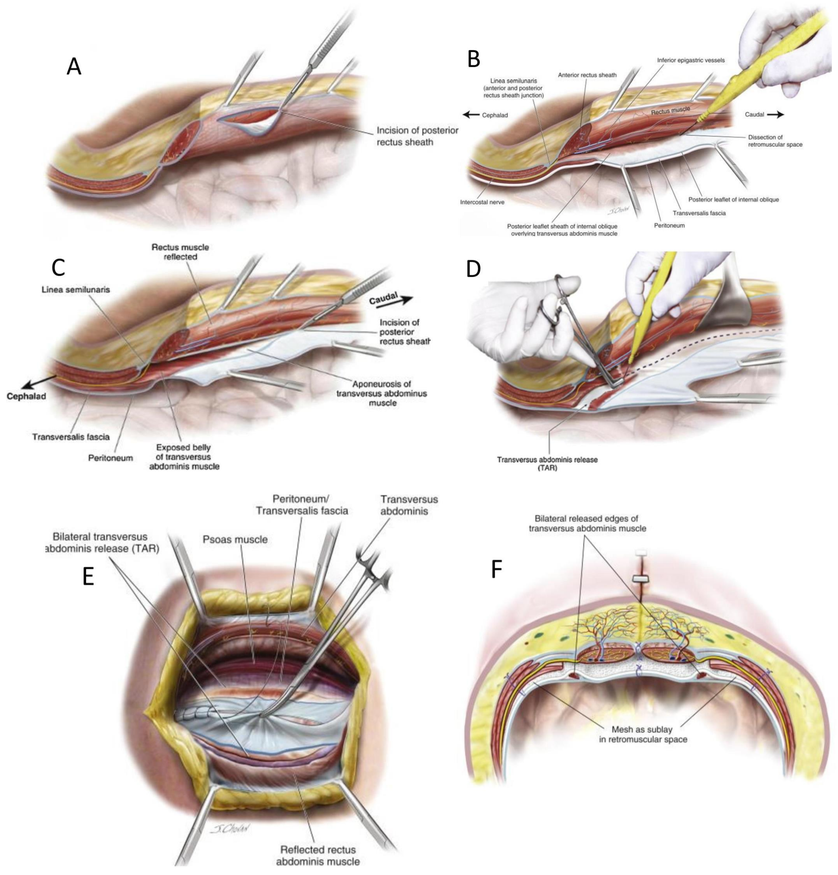

Figure 4: TAR steps simplified. Following a laparotomy, reduction of hernia and adhesiolysis. *(A)* Medial incision of the posterior rectus sheath (PRS). *(B)* Creation of the retrorectus space. *(C)* Division of the PRS medial to the semilunar line and perforating neurovascular exposing underlying transversus abdominis (TA) muscle. *(D)* Division of the TA muscle above the peritoneum and creation of the extraperitoneal space. This is repeated on the contralateral side. *(E)* The posterior sheath is reapproximated with a sublay plane created for a large mesh. *(F)* Sublay mesh in the retrorectus and extraperitoneal space. *Adapted from* (2)